AMENDMENTS TO THE DRAWINGS:

In the Office Action at page 3, paragraph 1, the Examiner objected to the drawings. To overcome these objections, replacement figures are submitted herewith. FIGS. 1 and 2 are being labeled as "PRIOR ART". Approval of these changes to the Drawings is respectfully requested.

Enclosures: Replacement sheets.

REMARKS

In accordance with the foregoing, claims 6-8, 10, 11, 13, and 14 have been amended. Claims 6-16 are pending and under consideration.

EXAMINER INTERVIEW

Applicants wish to thank the Examiner for the courtesy of the telephone interview granted to Applicants' representatives on April 7, 2006, at which time the outstanding issues in this case were discussed. Arguments similar to those below were presented and the Examiner indicated that in light of the arguments, the amended claims appear to overcome at least the § 112 rejections and he would reconsider the outstanding grounds for rejection upon this written submission of the response.

DRAWINGS

In response to the objection to the drawings, submitted herewith are Replacement Sheets for Figs. 1 and 2 having the "PRIOR ART" labels required in the Office Action.

CLAIM OBJECTIONS

The Examiner objected to claim 6 and suggested using "first metric values" instead of "first metrics values." Claims 6-8 and 14 have been amended to use the phrase "first metric values" consistently.

CLAIM REJECTIONS UNDER 35 U.S.C. §112

Claims 6-16 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

In the Office Action, the term "precisely" used in the claims is indicated as part of the reason for rejection. As discussed during the April 7, 2006 Interview, Applicants used the term "precisely" in claim 6, as a limiting term aimed to distinguish between a MaxLogMap algorithm **with** a "decoding window" and a MaxLogMap algorithm **without** a "decoding window." This meaning of the term "precisely" is supported by the Specification of the present Application at page 2, paragraph [0012]:

> Decoding results (soft output values) which are, by way of comparison, obtained using a MaxLogMAP algorithm without a decoding window may be more **precise**, but expensive hardware and memories are required for this purpose

(emphasis added).

To clarify the intended meaning, Applicants have amended claim 6 herein by deleting the term "precisely" and specifying that the MaxLogMAP algorithm is used "without a decoding window." During the April 7, 2006 Interview, the Examiner expressed concern regarding whether the proposed amendment would insert a negative limitation in the claim language. However, it is well established that merely using a negative limitation is not a proper basis for rejection of a claim under the second paragraph of 35 U.S.C. § 112, see, e.g., *In re Barr, Williams, and Whitmore*, 444 F.2d 588, 170 USPQ 330, 337 (CCPA 1971), citing *In re Wakefield*, 57 CCPA 959, 967, 422 F.2d 897, 904, 164 USPQ 636, 641 (CCPA 1970). During the April 7, 2006 Interview, Applicants' representatives pointed out that MaxLogMAP algorithms may be applied within a decoding window or without a decoding widow (i.e., over the whole data sequence) as recited in claim 6. The claimed application of the MaxLogMAP algorithms without a decoding window simply describes how the algorithms are being applied; the whole sequence of operations recited in claim 6 provide precise soft output values for decoding with inexpensive hardware (see page 3, paragraph [0014] of the application).

In the dependent claims, to avoid using the term "precisely," claims 10, 11, 13, and 16 have been amended, replacing the phrase "precisely one" with "a single." No new matter has been added.

Regarding the definition of "n" and "i," claim 6 has been amended to define "n" as being a number of operation performed "until the metric values for the forward direction and for the backward direction meet in one trellis segment," prior to introducing "i" which depends on "n." Further, since claim 6 defines "i" as an index in operation performed iteratively, the "i-1-th" operation is performed prior to the "i-th" operation. During the Interview, the Examiner suggested adding an explicit recitation that n is a positive integer greater than 1. However, in light of the condition "$1 < i \leq n$" recited in the line 11 of claim 6, n is inherently a positive integer greater than 1.

Regarding the definition of term "K", Applicants respectfully note that "K" is defined in the preamble of claim 6 ("a data sequence of K information bits"). Regarding the terms "$\delta 1$" and "δi-th" in claims 8 and 14, Applicants respectfully submit that these terms are defined in the claims as the memory depths of the first and i-th memory levels, respectively.

Applicants submit that the above explanations and claim amendments address the grounds of the claim rejections under 35 U.S.C. §112, and respectfully requests the rejections to be withdrawn.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 6-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Published Patent Application No. 2002/0012408 A1 by Nieminen et al. (hereinafter "Nieminen") in view of U.S. Patent No. 6,226,773 B1 to Sadjadpour (hereinafter "Sadjadpour").

Nieminen is directed to a method of decoding a convolutionally encoded codeword by sliding a window over the codeword, in which the path metrics are computed simultaneously forwards and backwards in the sliding window and a decoding result is computed based on the path metrics. This algorithm yields rather inaccurate results.

In contrast, the present general inventive concept provides carrying "out a decoding of a data sequence encoded with the aid of a binary convolutional code, using a MaxLogMAP algorithm, in such a manner that **precise** soft output values are formed as decoding results with inexpensive hardware."

Nieminen and Sadjadpour do not teach or suggest all the elements of the claims. More specifically, Nieminen and Sadjadpour do not teach:

(1) "calculating in a first operation, on a trellis diagram having trellis segments, first metric values of all trellis segments for a forward direction and for a backward direction using a MaxLogMAP algorithm without a decoding window;"

(2) "selecting a first set of trellis segments as first interpolation nodes from the first operation" and "storing first associated metric values for the first set of trellis segments in a first memory level;"

(3) "iteratively performing a number of n operations until the metric values for the forward direction and for the backward direction meet in one trellis segment, including:
   (a) calculating in an i-th operation for $1< i \leq n$, i-th metric values of internodal trellis segments positioned between the interpolation nodes of an i-1-th operation for the forward and the backward directions using stored metric values of interpolation nodes of the i-1-th operation,
   (b) selecting an i-th set of trellis segments as i-th interpolation nodes from the i-th operation, and
   (c) storing i-th associated metric values for the i-th set of trellis segments in an i-th memory level."

(4) "carrying out a decision process to calculate soft output values for decoding."

In the Office Action, it was asserted at page 5, lines 12-21 that the method of claim 6 is disclosed by Nieminen. However, no connection between the elements of claim 6 and teachings of Nieminen is provided, and instead, the method in Nieminen is described using language from Nieminen for which is indicated support in Nieminen.

One feature clearly distinguishing the present general inventive concept from Nieminen is that in the present application the method uses a MaxLogMAP algorithm without a decoding window while a MaxLogMAP algorithm with a decoding window is used in Nieminen.

The Office Action conceded that Nieminen does not teach calculating an i-th operation and relies on Sadjadpour to teach this element. Sadjadpour discloses a method for minimizing memory requirements for decoding computations using Maximum Likelihood Probability MAP-based decoding in which alpha values and beta values (the metric values of the forward and of the backward direction) are calculated simultaneously and stored in the memory. "Soft output" values are calculated **immediately** from the stores values and then the stored values are deleted.[1]

Unlike Sadjadpour, in the present general inventive concept, selected metric values are stored and used in a subsequent operation as "points of support", and the soft –output values are formed only **after** calculating and storing selected metric values corresponding to the operations until the metric values of the forward and of the backward direction meet. In view at least of the above-described difference, Applicants respectfully submit that Sadjadpour does not teach the i-th operation recited in claim 6.

Furthermore, Nieminen and Sadjadpour are disparate teachings raising the question of why a person skilled in the art would even consider these references for a combination, which question the PTO must answer.[2]

Also, MPEP 2143.01 states that "[o]bviousness can only be established by combining or modifying the teaching of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art."

Moreover, MPEP 2144.08 III states that "[e]xplicit findings on motivation or suggestion to select the claimed invention should also be articulated in order to support a 35 U.S.C. 103

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[1] See Sadjadpour, col. 2, lines 49-60.

[2] See, *In re Lee*, 61 USPQ2d 1430, 1434, Fed. Cir. 2002, requiring the PTO to "explain the reasons one of ordinary skill in the art would have been motivated to select the references ...."

ground of rejection. ... Conclusory statements of similarity or motivation, without any articulated rational or evidentiary support, do not constitute sufficient factual findings." Thus, even if the combination of Nieminen and Sadjadpour would teach the elements of the claimed invention, in absence of the motivation to combine it would not have been obvious. Specifically, in Page 6 of the Office Action, it is stated that modifying Nieminen to incorporate elements allegedly disclosed by Sadjadpour "would have been obvious to one of ordinary skill in the are because one of ordinary skill would have recognized that by calculating an i-th operation wherein i is greater than 1 and less or equal to n within the decoding process of Nieminen would have minimized memory requirements." The paragraph amounts to conclusory statements and hindsight, without citing any findings in the record of motivation to combine Nieminen and Sadjadpour.

CONCLUSION

In view of the above-presented arguments that the cited prior art references Nieminen and Sadjadpour do not teach or suggest all the elements and limitations of the claimed invention, and that combining Nieminen and Sadjadpour is not obvious, Applicants respectfully submit that claim 6 and the claims depending therefrom are patentable.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 4/10/06

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